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FOREST INSECT CONDITIONS ON
THE NORTHERN CHEYENNE INDIAN RESERVATION,
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by

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An examination of forest insect conditions on the Northern Cheyenne Indian Reservation was conducted November 9 and 10. Areas examined were those where defoliation by a pine looper, Phaeoura mexicanaria (Grote) had caused widespread injury^{1/}. Past and proposed salvage logging areas and recently thinned areas were examined.

The pine looper was not a problem in 1971. The population collapse in 1970 was so complete that very few loopers were detected in 1971.

Bark beetles are currently a serious problem on the reservation. Their present high level of activity is a result of a number of factors including:

1. Looper epidemics in 1969 and 1970.
2. Storm damage of 1969.
3. Logging.
4. Thinning.
5. Fire.

^{1/} Dewey, J. E. Status of the pine looper in southeastern Montana 1970. USFS, Northern Region, Division of State and Private Forestry. Unpublished report, 6 pp, 1971.

The bark beetles which pose significant problems are the six-spined engraver beetle Ips calligraphus (Germar); pine engraver, I. pini (Say); mountain pine beetle, Dendroctonus ponderosae Hopk.; and the red turpentine beetle D. valens Lec. The status of each of these beetles follows:

SIX-SPINED ENGRAVER, Ips calligraphus (Germar).--This beetle is usually of little consequence in the Northern Rocky Mountains; however, it reached epidemic proportions in the weakened looper defoliated trees and became the primary tree killer on the reservation. In 1971 the less severely defoliated trees began to "green up" and the I. calligraphus population started to decline. Presently very few trees containing active brood can be found. It is suspected this insect is dependent upon weakened trees for host material. Now that the trees are recovering from looper defoliation, I. calligraphus populations have declined to endemic levels.

PINE ENGRAVER, Ips pini (Say).--The pine engraver builds up to epidemic levels in disturbed areas. Defoliation, storm damage, logging, thinning, and fire all promote I. pini activity. This insect is having its greatest impact on the residual trees in thinned stands and areas which have been selectively logged. Many leave trees have been scorched as a result of slash burning, making them particularly attractive to I. pini. Most of the trees killed outright by the pine engraver are in smaller diameter classes (2 to 8 inches). Many of the larger trees have dead tops indicative of I. pini attack in the upper crown. Top kill of the large trees renders them more susceptible to attack by other insect and disease agents. At the present time few I. pini can be found in the trees because most of them overwinter in the litter as adults. No sampling system has been developed to evaluate pine engraver trends. Predictions are based on general observations. This beetle seems to be influenced quite strongly by climatic conditions--warm, dry springs and summers seem to favor population increases. Based on the number of recent pine engraver killed trees and the remaining susceptible host trees, it is expected this insect will continue to be a serious problem in 1972.

MOUNTAIN PINE BEETLE, Dendroctonus ponderosae Hopk.--The mountain pine beetle has been endemic on the reservation for many years, killing small numbers of ponderosa pines annually. Localized infestations have occurred in Stebbins and Rye Grass Creeks. About 50 trees attacked in 1971 were counted in Stebbins Creek in September. Small groups of 1 to 12 newly attacked trees were detected at scattered locations in areas which suffered heavy defoliation by the pine looper in 1969 and 1970.

The potential for a serious mountain pine beetle infestation is quite high. This insect often does well in mature and overmature pure pine stands such as those which occur on the reservation. There are sufficient beetles present to cause significant tree mortality in 1972 if conditions are satisfactory.

Because the entire population overwinters in the trees, control can be achieved by tree removal. Beetles remain in the trees until late June. In order for control to be effective, a thorough job of locating, marking, and removing infested trees is mandatory.

RED TURPENTINE BEETLE, Dendroctonus valens (Lec.).--Red turpentine beetles have built up to unusually high levels in many trees which received severe looper defoliation. Some mortality is resulting. It is expected that they will return to an endemic level when the trees have completely overcome the effect of the defoliation.

DISCUSSION AND RECOMMENDATIONS

From observations to date it appears that the immediate insect problems on the reservation are the mountain pine beetle and the pine engraver.

Complete agreement among forest entomologists on how to prevent pine engraver damage has not been reached. One school of thought is not to thin between January and August. This would allow the August to January slash to dry out sufficiently by spring to prevent beetle development. However, our experience has been that the slash doesn't always dry out sufficiently. Consequently, it is invaded by beetles in the spring. Another thought is to keep a continual supply of green slash available as an attractant. Pine engravers prefer slash to standing trees. If sufficient slash is available to absorb the entire population, standing trees are normally not attacked. Caution should be taken to prevent injury to residual trees in thinned stands and to avoid piling green slash next to residual trees. Mechanical injury and scorching make residual trees highly susceptible to attack.

The most effective and economical means of treating mountain pine beetle infestations is to remove infested trees by commercial sales. Other control measures include felling and burning or felling and spraying infested trees with ethylene dibromide. The mountain pine beetle generally prefers to invade overstocked stands of ponderosa pine which are in need of thinning^{2/}. Thinning operations currently in progress on the reservation should reduce the incidence of mountain pine beetle attack.

^{2/} Sartwell, Charles. Thinning ponderosa pine to prevent outbreaks of mountain pine beetle. In proceedings, precommercial thinning of coastal and intermountain forests in the Pacific Northwest. Cooperative Extension Service and Department of Forestry and Range Management. Washington State University, Pullman, 1971.